

Fig. 1

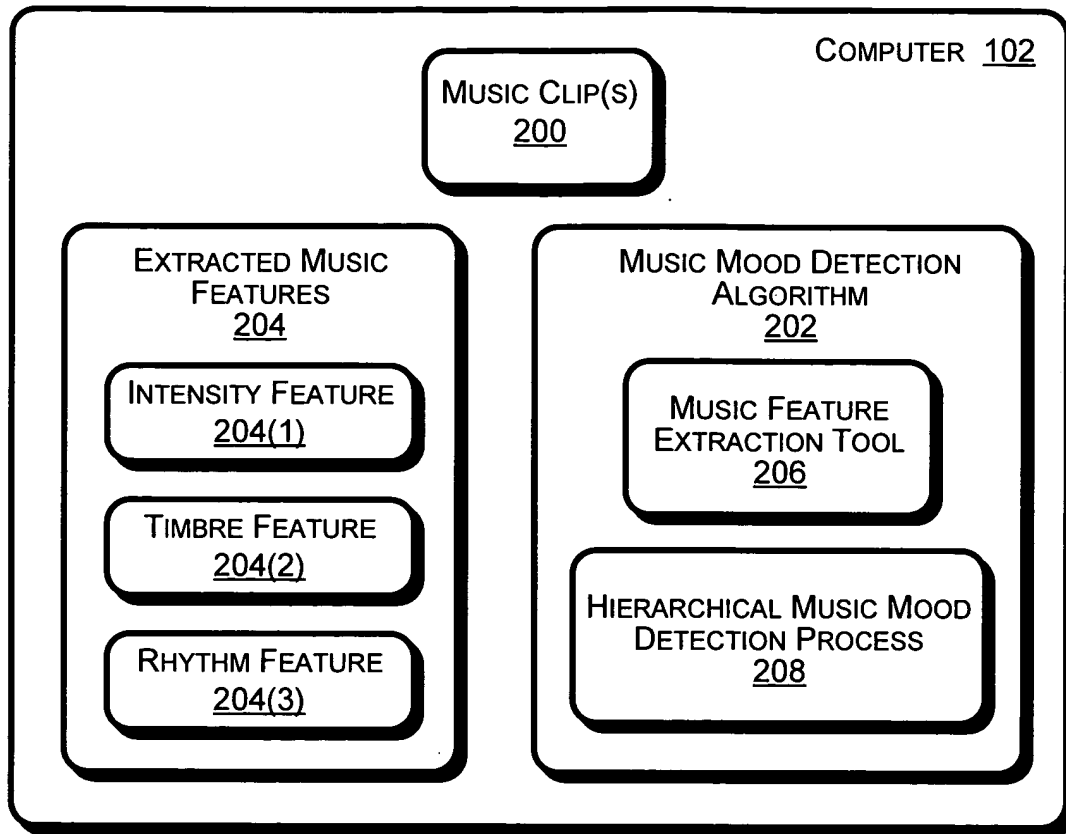


Fig. 2

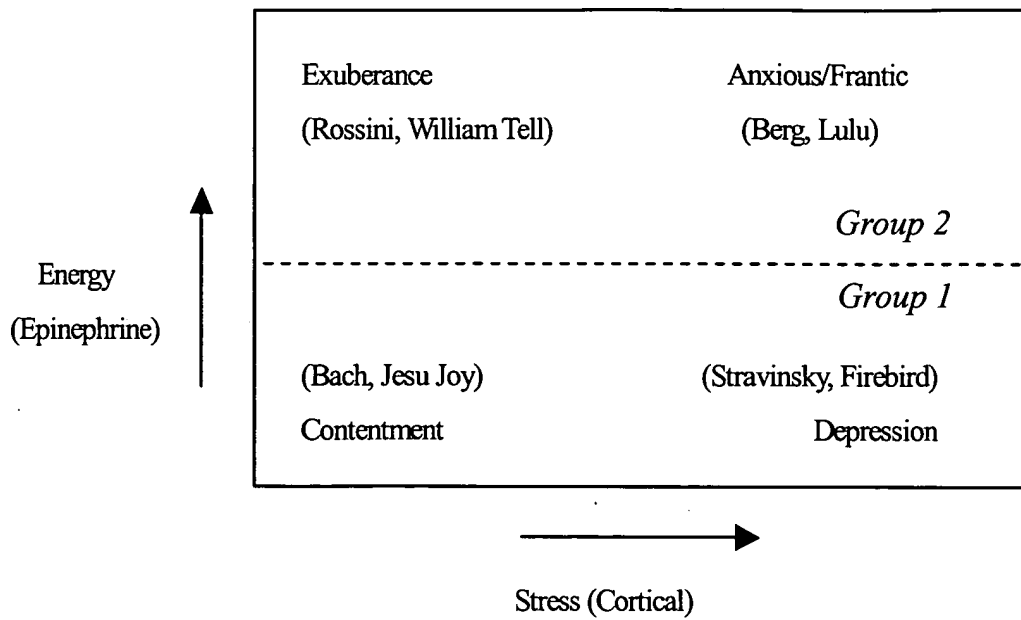


Fig. 3

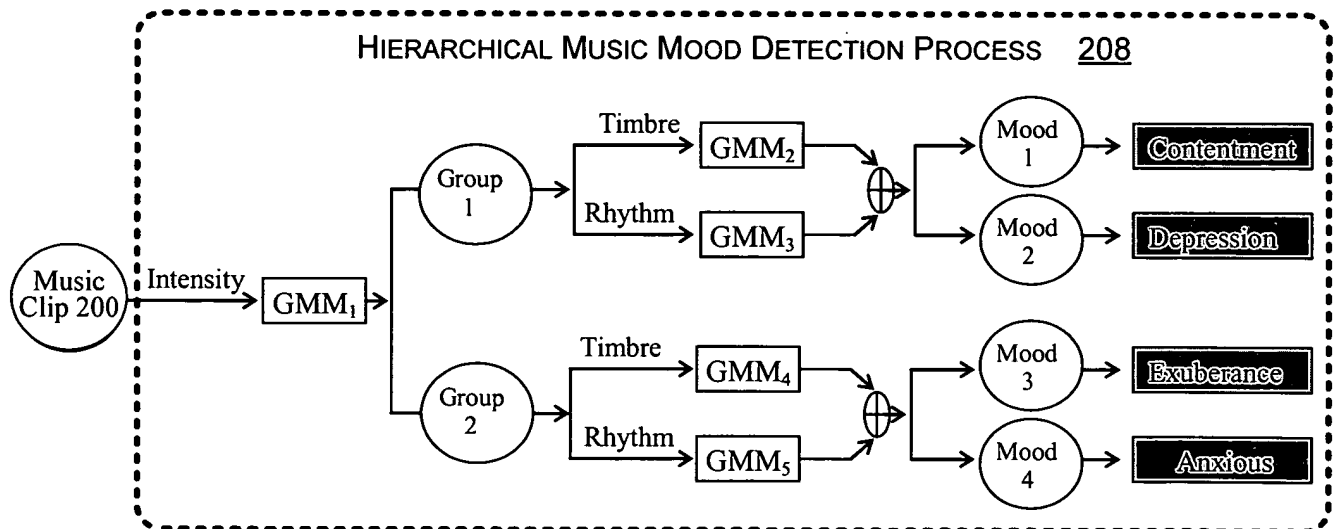


Fig. 4

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Extract intensity feature, timbre feature, and rhythm feature from a music clip:

- convert music clip into uniform format
- divide music clip into plurality of frames
- divide each frame into octave-based frequency sub-bands
- calculate RMS signal amplitude for each sub-band of each frame
- sum RMS signal amplitudes across sub-bands for frame intensity
- average frame intensities for intensity feature of music clip
- calculate spectral shape features for each frame
- calculate spectral contrast features for each frame
- represent timbre feature with spectral shape/contrast feature(s)
- extract amplitude envelope from low and high sub-band of each frame
- estimate difference curve of amplitude envelope
- detect peaks above a threshold in curve as instrumental onsets
- extract average rhythm strength of instrumental onsets
- extract rhythm regularity based on avg of max 3 peaks in curve
- extract rhythm tempo based on common divisor of peaks in curve

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Classify music clip into a mood group based on intensity feature:

- determine probability of a 1st mood group based on intensity feature
- determine probability of a 2nd mood group based on intensity feature
- select 1st mood group if probability of 1st mood group is \geq probability of 2nd mood group
- otherwise select 2nd mood group

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Classify music clip into exact music mood from mood group (having 1st mood and 2nd mood) based on timbre and rhythm features:

- determine probability of a 1st mood based on timbre & rhythm features
- determine probability of a 2nd mood based on timbre & rhythm features
- select 1st mood as exact mood if probability of 1st mood is \geq probability of 2nd mood
- otherwise select 2nd mood as exact mood

Fig. 5